誰的非結核分枝桿菌肺病該接受治療

who needs treatment for NTM lung disease?

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Abstract:

Nontuberculous mycobacterium (NTM) can cause progressive lung disease (LD) in both immune-compromised and immune-competent individuals. However, it is difficult to differentiate NTM respiratory colonization from NTM-LD. In addition, it remains challengeable for physicians to determine whether a patient needs treatment for NTM-LD.

According to the American Thoracic Society (ATS)/ Infectious Disease Society of America (IDSA) guideline published in 2007, diagnostic criteria for NTM-LD included clinical features, compatible radiological presentations, and microbiological evidence. The updated 2020 ATS/IDSA practice guideline and the 2017 British Thoracic Society (BTS) guideline also recommends the use of these criteria to identify patients with NTM-LD. Because the diagnosis of NTM-LD itself does not necessitate the initiation of anti-NTM treatment, we should consider host-, bacterial and environmental factors to identify patients who require NTM-LD treatment.

The common symptoms of NTM-LD are cough and sputum production. Other less common symptoms are fever, hemoptysis, and weight loss. However, the symptoms are nonspecific and may occur in subjects with pre-existing structural lung diseases. Although the guideline ask an appropriate exclusion of other diseases, it is somewhat difficult to distinguish the symptoms of NTM-LD from those caused by underlying lung condition. Thus, for symptomatic NTM-LD suspects, it is important to assess whether they had compatible radiological findings, including nodular or cavitary opacities on chest radiograph or multifocal bronchiectasis with small nodules on high-resolution computed tomography. After making the diagnosis, it is generally recommended to provide antibiotic treatment for a patient with symptomatic NTM-LD or radiographic progression, namely cavitary formation or extensive lung lesions.

More importantly, regarding microbiological criteria, it is recommended to obtain ≥2 sputum cultures of the same NTM species because NTM can be isolated from respiratory samples in uninfected subjects due to environmental contamination and in patients without progressive lung disease. For example, as reported in a research of *Mycobacerium avium* complex (MAC)-LD, only 2% of patients with one MAC isolate had significant pulmonary lesions but up to 90% and 98% of patients

with 2 and 3 MAC isolates did. Considering pathogenicity of specific NTM species, *M. kansasii* isolated from respiratory specimens is usually pathogenic whereas *M. gordonae* is not. Thus, prior to initiating treatment, physicians should carefully assesse the virulence of the organism, disease severity, risks and benefits of therapy as well as the goals of therapy.

Actually, patients with NTM-LD usually present with indolent disease courses and may be stable for years without treatment. Thus, in some instances, “watchful waiting” may be the preferred course of action in patients with NTM-LD, especially in those with minimal symptoms, non-extensive radiographic changes, and low bacterial load. Sometimes, worsening symptoms in patients with NTM-LD may be resulted from underlying structural lung disease but no NTM-LD itself. For example, patients may experience respiratory symptoms due to bronchiectasis and COPD, which may benefit from targeted therapy including bronchodilator treatment. Regarding pulmonary hygiene, patients with NTM-LD and sputum impaction may benefit from mucolytic agents as well as non-pharmacological management including chest percussion and postural drainage.

Aside from non-pharmacological management focusing on respiratory therapy, pulmonary rehabilitation and optimal nutritional strategy also have role on reducing exercise intolerance and improving health-related quality of life in patients with NTM-LD. A pulmonary rehabilitation program can comprise **airway clearance techniques instruction and exercise training program**. Airway clearance techniques can improve the volume of sputum expectorated, cough symptom, breathlessness, and quality of life. Exercise training can improve exercise capacity and quality of life, and reduce dyspnea. Finally, since b**ody weight and muscle mass loss are common** in patients with NTM-LD, a**n adequate protein and caloric diet** might be the most appropriate dietary strategy.

In conclusion, to make the diagnose NTM-LD, physicians should use the guideline-based criteria which consists of clinical features, compatible radiological presentations, and microbiological evidence. For patients meeting the diagnostic criteria of NTM-LD, physicians can optimize respiratory care first and provide pulmonary rehabilitation and nutritional support as necessary. In patients with virulent NTM species, severe disease showing cavitary lesions, disease progression or worsening symptoms despite of non-pharmacological care, physicians should consider initiating antibiotic treatment for patients with NTM-LD.